Conservative Management of Acute Hydronephrosis of Pregnancy: Two Centers Experience

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Abstract

Objectives: This study is aiming to detect the value of conservative management of acute hydronephrosis of pregnancy by facilitating postural drainage of the affected kidney.

Patients and Methods: This prospective study was carried out from March 2011-March 2012, in two centers: [Bab Alshaaria University Hospital (Cairo), and Assiut University Hospital (Assiut)]. One thousand two hundred pregnant women managed till full term, 86 of them (7.1%) presented with unilateral loin pain and were in the third trimester of pregnancy at presentation (13 patients at 28 weeks, 39 patients at 30 weeks, and 34 patients at 32 weeks). Age range was 18-39 years.

Seventy six patients (88.3%) presented with right-sided loin pain and 10 (11.7%) had pain in the left loin. There was no evidence of incipient urinary tract infection (UTI). Ultrasound scan (USS) confirmed presence of ipsilateral mild to moderate hydronephrosis with no evidence of renal/ureteric calculus.

All were refractory to routine enteral or parenteral analgesia over 72 hours.

They were managed in a semiprone position while in bed, with the affected side up and non-dependant. Head end of their bed was kept raised by 10º throughout this period of conservative management; initiated in the hospital and continued at home until term.

Results: Eighty of the 86 women (93%) had symptomatic improvement. None required regular analgesia and went to term without further intervention (e.g. nephrostomy, stenting .... ). Follow-up by Ultrasound scan (USS) at three months post-partum revealed complete resolution of hydronephrosis.

Conclusions: Postural drainage of the kidney is highly effective in the management of acute symptomatic hydronephrosis of pregnancy in the majority of cases (93%), and if used diligently, it will help to prevent the need for invasive uro-radiological intervention.

Key Words: Conservative – Hydronephrosis – Pregnancy – Postural drainage.

Introduction

DURING pregnancy, mild hydronephrosis is considered a normal phenomenon and may be present in up to 90% of pregnancies [1-3]. Dilation is usually more pronounced on the right kidney [4,5], in primigravidae and after mid-pregnancy [6]. This dilation disappears a few weeks after birth [7]. Acceptable explanations for this phenomenon are compression of the gravid uterus on the ureters and the smooth muscle relaxing influence of progesterone [1,8]. The predisposition for the right side may be explained by the dextrorotation of the uterus and the relative protection of the left ureter provided by the sigmoid colon. Increased diuresis, small stones or other unrecognised factors may cause decompensation of ureteral function, progressing to symptomatic acute hydronephrosis [9-11]. The majority (90%) of cases are caused by physiologic mechanisms, and most of them are uneventful [2]. Some patients experience severe flank pain and hematuria due to sloughed renal papillae [8].

The process may begin as early as the sixth week of gestation and 90% of women will have some element of hydronephrosis by the 28th week [12,13]. In most pregnancies, these changes remain asymptomatic and do not cause complications. Five to 10% of pregnant women may develop flank pain requiring investigation and a urological opinion [12]. These complications have been associated with spontaneous abortion, hypertension, preterm labour and low birth weight [14,15]. In the clinical setting, it is often difficult to diagnose pathological obstruction, as the symptoms of nausea, vomiting, back pain, urinary frequency and dysuria can all be present during the course of a normal pregnancy (Table 1). In addition, it is difficult to image the ureters in pregnancy, as computed tomography (CT) is generally avoided [15,16].
Table 1: Symptoms and signs of acute hydronephrosis of pregnancy.

- Pain: abdominal or flank.
- Hematuria: microscopic or macroscopic.
- Nausea and vomiting.
- Dysuria.
- Voiding symptoms.

Conservative measures are advocated in managing women with symptomatic hydronephrosis of pregnancy and intervention indicated only in those failing to respond to conservative management [4].

This aim of this study is to detect the value of conservative management of acute hydronephrosis of pregnancy mainly by facilitating postural drainage of the affected kidney.

**Patients and Methods**

This prospective study was carried out from March 2011-March 2012, in two centers: [Bab Alshaaria University Hospital (Cairo), and Assiut University Hospital (Assiut)]. One thousand two hundred pregnant women managed till full term, 86 of them (7.1%) presented with unilateral loin pain and were in the third trimester of pregnancy at presentation (13 patients at 28 weeks, 39 patients at 30 weeks, and 34 patients at 32 weeks). Age range was 18-39 years (Mean age: 24.8 years). Clinical data for these patients was collected prospectively with stringent follow-up for up to three months after delivery to confirm successful outcome of their conservative management. Seventy-six women presented with right sided pain and 10 had pain in the left loin. Their blood picture and midstream urine (MSU) examination revealed no evidence of incipient urinary tract infection (UTI). None had significant impairment of renal function. Ultrasound scan (USS) confirmed presence of mild to moderate hydronephrosis on the affected side with appearances not dissimilar to any asymptomatic hydronephrosis of pregnancy and no evidence of urinary calculus disease.

Regular enteral and parenteral analgesia was offered to all women for up to 72 hours but, failed to improve their presenting symptom of loin pain. Six out of 86 women (6.97%) had severe refractory pain or became systemically unwell to warrant intervention such as insertion of a ureteric stent or percutaneous nephrostomy (PCN) and were excluded from the final analysis.

All the remaining 80 symptomatic women were managed with bed rest on a tilted bed with its head end raised by 10°, and the woman lying on the bed in a semi prone position with the affected side up throughout the period of conservative management up to full term. It was initially instituted in the hospital setting with a mean inpatient stay of three days and subsequently continued with similar arrangements at home.

During this period however, all women remained fully ambulatory and adopted the semi-prone position on the head end-elevated sloping bed only while resting both during the day and night.

**Results**

Eighty of the 86 women (93%) in our study had substantial symptomatic improvement with this regime aimed at encouraging postural drainage of the obstructed kidney. None required further regular analgesia as long as they followed this regime and went on to term without intervention in the form of JJ stenting or nephrostomy. In our study; the incidence of symptomatic hydronephrosis of pregnancy was (7.1%).

Ultrasound scan was able to reveal the hydronephrotic condition of all patients, and was used to verify the status of ureteral patency instead of IVP, which carries a risk to the fetus. People in our society cannot accept radiographic studies during pregnancy. In our study, only ultrasonography was used for the initial diagnosis, so it can replace the radiographic studies (e.g. IVP and CT) during pregnancy. Follow-up USS at three months postpartum revealed complete resolution of hydronephrosis and no evidence of urinary calculi.

During this observational period to term, these women served as their own controls because they experienced loin pain whenever they did not adopt the recommended semiprone position during resting but had pain relief following change of position and at times required an occasional dose of oral analgesia. All women maintained adequate urine output throughout this regime independent of the position and this could be attributed to the non-obstructed normally functioning contralateral renal unit.

**Discussion**

The dilatation of the urinary collecting system is a common finding during pregnancy affecting over 90% of pregnant women [17,18]. It develops from as early as week 6 to week 10 of gestation and such onset of dilatation is seen earlier than previously reported on routine prenatal ultrasound.
Scans (USS) however, the degree of obstruction can be quite variable for the asymptomatic patient [19]. These changes are a consequence of: Increased renal blood flow (up to 75% by term) and the smooth muscle relaxant effects of progesterone as well as mechanical obstruction from the enlarging fetus and uterus, hence predominantly seen on the right side but not in pelvic kidneys and those transplanted into ileal conduits. Hydronephrosis of pregnancy is not seen in quadrupeds such as dogs and cats where the gravid uterus in a dependent position falls away from the ureters. We believe the same mechanism works in human beings when the woman adapts a semiprone position with the affected side up and head end elevated, thereby allowing the gravid uterus to fall forward away from the retroperitoneal ureters and taking the mechanical pressure off them, particularly the affected ureter and allowing it to drain more freely. Ureteric drainage is further helped by the head-up position of the bed [19].

The most common etiology of severe loin pain in pregnancy is acute hydronephrosis. If acute hydronephrosis of pregnancy left untreated, it can progress to life threatening infection which may endanger the mother and the fetus [8]. This state can give a picture of acute abdomen, producing a difficult differential diagnosis [20].

In this study, it was found that sonography with the assistance of Doppler is suitable for evaluation of hydronephrosis grade and ureteric function. Intravenous pyelography was unnecessary in all cases. Our results accord with previous findings [5,6,21] of right predominance of hydronephrosis in pregnancy and of higher incidence of this condition in primiparae.

X-ray exposure is harmful to the fetus, but without a radiographic study, it is difficult to determine the definite etiology for symptomatic hydronephrosis during pregnancy. Lipsky proposed X-ray use with caution. Carefully restricting the radiation doses of the fetus can be achieved by limiting the number of X-ray films [22]. Other authors suggested that X-ray can be used with new X-ray monitoring systems and fetus shielding [23-26].

Most studies reported in the literature recommend conservative approach for the management of hydronephrosis of pregnancy including renal colic in pregnancy [27] and aggressive methods such as insertion of JJ ureteral stent reserved for those not responding to conservative measures [28-30]. Insertion of percutaneous nephrostomy (PCN) has been advocated in patients with symptomatic hydronephrosis associated with spontaneous extravasation of urine, urosepsis and azotemia [31,32] while ureteroscopic removal of stone only in selected cases [33,34].

In our study, the incidence of symptomatic hydronephrosis of pregnancy was slightly higher (7.1%) compared to other studies (5.2%) [28]. Which may simply be the result of variation in the patient population with regards to patient age, gestational age at presentation, parity, ethnicity, pain threshold and we need a larger prospective study to compare the effects of these factors. Obstruction due to calculus disease was ruled out with reasonable confidence based on USS findings with clinical and haematological picture as well as urine microbiology. Those cases in which calculus obstruction was suspected were further investigated with a single film IVU but are not included in this study.

All women responded very well to the postural drainage regime of spending most of their time in bed lying semiprone with the affected (mostly right) side up. A clear understanding of the problem and full cooperation from the patient was vital for a successful outcome avoiding any active intervention up to term in this scenario.

The authors believed that this simple conservative approach will avoid unnecessary interventions in the majority of cases and also avoid consequential prolongation of inpatient hospital stay and inherent increase in distress. It will substantially reduce the overall cost of management which has significant implications in the developing world, both in the private and governmental hospitals.

Conclusion:

This prospective observational study has shown that postural drainage of the obstructed kidney is highly effective in the management of acute symptomatic hydronephrosis of pregnancy in the majority of cases (93%), and if used diligently, it will help to prevent the need for invasive uro-radiological intervention.

References
